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the bowsprit, which is six feet above the water. If the cable is hauled in at the rate of a foot a second, how fast is the vessel moving through the water when there is five fathoms of cable out? What is the acceleration of the vessel's velocity? [From *Byerly's Problems in Differential Calculus.*] ANS.—(a) 5/6 feet per second; (b)12/121 feet per second. Are these results correct?

⁂ Solutions of this problem should be sent to J. M. Colaw, not later than November 10.

MECHANICS.

73. **Proposed by J. K. ELLWOOD, A. M., Principal of Colfax Schools, Pittsburg, Pa.**

A sixteen-foot plank weighs thirty-two pounds and is supported by two props, four feet and two feet from the ends. What weight is supported by each prop?

74. **Proposed by B. F. FINKEL, A. M., M. Sc., Professor of Mathematics and Physics, Drury College, Springfield, Mo.**

In the experiment of swinging in a vertical circle a glass containing water, and suspended by means of a string, if the string be two feet long, what must be the velocity at the lowest point if the experiment is to succeed? [From *Ziwet's Theoretical Mechanics*, Part III., p. 96.]

⁂ Solutions of these problems should be sent to B. F. Finkel, not later than November 10.

AVERAGE AND PROBABILITY.

69. **Proposed by Rev. W. ALLEN WHITWORTH, M. A.**

There are n equal sugar sticks. Each stick is broken into two pieces, all positions of the fracture being equally likely. Of the two n pieces thus formed, a child is to take the largest. Show that his expectation is $[2n+1]/[2(n+1)]$ of a stick. [From *The Educational Times*, June, 1898.]

70. **Proposed by Professor MILLER.**

A ship at A observes another at B, whose course is unknown. Supposing their speed the same, prove that the chance of their coming within a given distance, d, of each other is always $(2/\pi)\sin^{-1}(d/a)$, whatever the course taken by A; provided its inclination to AB is not greater than $\cos^{-1}(d/a)$, where $AB=a$.

[From *Cambridge Mathematical Tripos*, 1871.]

⁂ Solutions of these problems should be sent to B. F. Finkel, not later than November 10.